SEQUENCE LISTING

<110> Xia, Menghang
    Williams, Mark E.

<120> Nucleic Acid Molecules Encoding Novel
  Human Low-Voltage Activated Calcium Channel Proteins,
  Designated - Alpha 1I-1 and Alpha 1I-2, Encoded Proteins and
  Methods of Use Thereof

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<140> PCT/US2004/031820
<141> 2004-09-28

<150> 60/508,112
<151> 2003-10-02

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Val Pro His Pro Asp Leu Ala Pro Ile Ala Phe Phe Cys Leu Arg Gln
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Thr Thr Ser Pro Arg Asn Trp Cys Ile Lys Met Val Cys Asn Pro Trp
65                  70                  75                  80
Phe Glu Cys Val Ser Met Leu Val Ile Leu Leu Asn Cys Val Thr Leu
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Gly Met Tyr Gln Pro Cys Asp Asp Met Asp Cys Leu Ser Asp Arg Cys
            100                 105                 110
Lys Ile Leu Gln Val Phe Asp Asp Phe Ile Phe Ile Phe Phe Ala Met
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Glu Met Val Leu Lys Met Val Ala Leu Gly Ile Phe Gly Lys Lys Cys
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Tyr Leu Gly Asp Thr Trp Asn Arg Leu Asp Phe Phe Ile Val Met Ala
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Gly Met Val Glu Tyr Ser Leu Asp Leu Gln Asn Ile Asn Leu Ser Ala
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Ile Arg Thr Val Arg Val Leu Arg Pro Leu Lys Ala Ile Asn Arg Val
            180                 185                 190
Pro Ser Met Arg Ile Leu Val Asn Leu Leu Leu Asp Thr Leu Pro Met
        195                 200                 205
Leu Gly Asn Val Leu Leu Leu Cys Phe Phe Val Phe Phe Ile Phe Gly
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Ile Ile Gly Val Gln Leu Trp Ala Gly Leu Leu Arg Asn Arg Cys Phe
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Gly Asp Asn Gly Ile Met Gly Cys His Glu Ile Pro Pro Leu Lys Glu
            275                 280                 285
Gln Gly Arg Glu Cys Cys Leu Ser Lys Asp Asp Val Tyr Asp Phe Gly
            290                 295                 300
Ala Gly Arg Gln Asp Leu Asn Ala Ser Gly Leu Cys Val Asn Trp Asn
305                 310                 315                 320
Arg Tyr Tyr Asn Val Cys Arg Thr Gly Ser Ala Asn Pro His Lys Gly
            325                 330                 335
Ala Ile Asn Phe Asp Asn Ile Gly Tyr Ala Trp Ile Val Ile Phe Gln
            340                 345                 350
Val Ile Thr Leu Glu Gly Trp Val Glu Ile Met Tyr Tyr Val Met Asp
            355                 360                 365
Ala His Ser Phe Tyr Asn Phe Ile Tyr Phe Ile Leu Leu Ile Ile Val
370                 375                 380
Gly Ser Phe Phe Met Ile Asn Leu Cys Leu Val Val Ile Ala Thr Gln
385                 390                 395                 400
Phe Ser Glu Thr Lys Gln Arg Glu His Arg Leu Met Leu Glu Gln Arg
            405                 410                 415
Gln Arg Tyr Leu Ser Ser Ser Thr Val Ala Ser Tyr Ala Glu Pro Gly
            420                 425                 430
Asp Cys Tyr Glu Glu Ile Phe Gln Tyr Val Cys His Ile Leu Arg Lys
            435                 440                 445
Ala Lys Arg Arg Ala Leu Gly Leu Tyr Gln Ala Leu Gln Ser Arg Arg
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Gln Ala Leu Gly Pro Glu Ala Pro Ala Pro Ala Lys Pro Gly Pro His
465                 470                 475                 480
Ala Lys Glu Pro Arg His Tyr Gln Leu Cys Pro Gln His Ser Pro Leu
            485                 490                 495
Asp Ala Thr Pro His Thr Leu Val Gln Pro Ile Pro Ala Thr Leu Ala
            500                 505                 510
Ser Asp Pro Ala Ser Cys Pro Cys Cys Gln His Glu Asp Gly Arg Arg
            515                 520                 525
Pro Ser Gly Leu Gly Ser Thr Asp Ser Gly Gln Glu Gly Ser Gly Ser
            530                 535                 540
Gly Ser Ser Ala Gly Gly Glu Asp Glu Ala Asp Gly Asp Gly Ala Arg
545                 550                 555                 560
Ser Ser Glu Asp Gly Ala Ser Ser Glu Leu Gly Lys Glu Glu Glu Glu
            565                 570                 575
Glu Glu Gln Ala Asp Gly Ala Val Trp Leu Cys Gly Asp Val Trp Arg
            580                 585                 590
Glu Thr Arg Ala Lys Leu Arg Gly Ile Val Asp Ser Lys Tyr Phe Asn
            595                 600                 605
Arg Gly Ile Met Met Ala Ile Leu Val Asn Thr Val Ser Met Gly Ile
610                 615                 620
Glu His His Glu Gln Pro Glu Glu Leu Thr Asn Ile Leu Glu Ile Cys
625                 630                 635                 640
Asn Val Val Phe Thr Ser Met Phe Ala Leu Glu Met Ile Leu Lys Leu
            645                 650                 655
Ala Ala Phe Gly Leu Phe Asp Tyr Leu Arg Asn Pro Tyr Asn Ile Phe
            660                 665                 670
Asp Ser Ile Ile Val Ile Ile Ser Ile Trp Glu Ile Val Gly Gln Ala
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Asp Gly Gly Leu Ser Val Leu Arg Thr Phe Arg Leu Leu Arg Val Leu
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Lys Leu Val Arg Phe Met Pro Ala Leu Arg Arg Gln Leu Val Val Leu
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Met Lys Thr Met Asp Asn Val Ala Thr Phe Cys Met Leu Leu Met Leu
                    725                      730                  735
Phe Ile Phe Ile Phe Ser Ile Leu Gly Met His Ile Phe Gly Cys Lys
                740                      745                  750
Phe Ser Leu Arg Thr Asp Thr Gly Asp Thr Val Pro Asp Arg Lys Asn
                755                      760                  765
Phe Asp Ser Leu Leu Trp Ala Ile Val Thr Val Phe Gln Ile Leu Thr
        770                      775                  780
Gln Glu Asp Trp Asn Val Val Leu Tyr Asn Gly Met Ala Ser Thr Ser
785                      790                      795                  800
Pro Trp Ala Ser Leu Tyr Phe Val Ala Leu Met Thr Phe Gly Asn Tyr
                805                      810                  815
Val Leu Phe Asn Leu Leu Val Ala Ile Leu Val Glu Gly Phe Gln Ala
                820                      825                  830
Glu Gly Asp Ala Asn Arg Ser Tyr Ser Asp Glu Asp Gln Ser Ser Ser
            835                      840                  845
Asn Ile Glu Glu Phe Asp Lys Leu Gln Glu Gly Leu Asp Ser Ser Gly
        850                      855                  860
Asp Pro Lys Leu Cys Pro Ile Pro Met Thr Pro Asn Gly His Leu Asp
865                      870                      875                  880
Pro Ser Leu Pro Leu Gly Gly His Leu Gly Pro Ala Gly Ala Ala Gly
                885                      890                  895
Pro Ala Pro Arg Leu Ser Leu Gln Pro Asp Pro Met Leu Val Ala Leu
                900                      905                  910
Gly Ser Arg Lys Ser Ser Val Met Ser Leu Gly Arg Met Ser Tyr Asp
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Gln Arg Ser Leu Ser Ser Ser Arg Ser Ser Tyr Tyr Gly Pro Trp Gly
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Arg Ser Ala Ala Trp Ala Ser Arg Arg Ser Ser Trp Asn Ser Leu Lys
945                      950                      955                  960
His Lys Pro Pro Ser Ala Glu His Glu Ser Leu Leu Ser Ala Glu Arg
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Gly Gly Gly Ala Arg Val Cys Glu Val Ala Ala Asp Glu Gly Pro Pro
            980                      985                  990
Arg Ala Ala Pro Leu His Thr Pro His Ala His His Val His His Gly
            995                      1000                     1005
Pro His Leu Ala His Arg His Arg His His Arg Arg Thr Leu Ser Leu
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Glu Asp Cys Asn Gly Arg Met Pro Ser Ile Ala Lys Asp Val Phe Thr
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Lys Met Gly Asp Arg Gly Asp Arg Gly Glu Asp Glu Glu Glu Ile Asp
            1075                     1080                     1085
Tyr Thr Leu Cys Phe Arg Val Arg Lys Met Ile Asp Val Tyr Lys Pro
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Asp Trp Cys Glu Val Arg Glu Asp Trp Ser Val Tyr Leu Phe Ser Pro
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Glu Asn Arg Phe Arg Val Leu Cys Gln Thr Ile Ile Ala His Lys Leu
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Phe Asp Tyr Val Val Leu Ala Phe Ile Phe Leu Asn Cys Ile Thr Ile
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Thr Leu Lys Val Val Ser Leu Gly Leu Tyr Phe Gly Glu Gln Ala Tyr
1185            1190            1195            1200
Leu Arg Ser Ser Trp Asn Val Leu Asp Gly Phe Leu Val Phe Val Ser
        1205            1210            1215
Ile Ile Asp Ile Val Val Ser Leu Ala Ser Ala Gly Gly Ala Lys Ile
        1220            1225            1230
Leu Gly Val Leu Arg Val Leu Arg Leu Leu Arg Thr Leu Arg Pro Leu
        1235            1240            1245
Arg Val Ile Ser Arg Ala Pro Gly Leu Lys Leu Val Val Glu Thr Leu
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Ile Ser Ser Leu Lys Pro Ile Gly Asn Ile Val Leu Ile Cys Cys Ala
1265            1270            1275            1280
Phe Phe Ile Ile Phe Gly Ile Leu Gly Val Gln Leu Phe Lys Gly Lys
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Phe Tyr His Cys Leu Gly Val Asp Thr Arg Asn Ile Thr Asn Arg Ser
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Asp Cys Met Ala Ala Asn Tyr Arg Trp Val His His Lys Tyr Asn Phe
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Asp Gly Trp Val Asn Ile Met Tyr Asn Gly Leu Asp Ala Val Ala Val
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Asp Gln Gln Pro Val Thr Asn His Asn Pro Trp Met Leu Leu Tyr Phe
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His Tyr Asn Gln Pro Thr Ser Leu Glu Thr Ala Leu Lys Tyr Cys Asn
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Tyr Met Phe Thr Thr Val Phe Val Leu Glu Ala Val Leu Lys Leu Val
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Gly Met Arg Ala Leu Leu Asp Thr Val Val Gln Ala Leu Pro Gln Val
        1570            1575            1580
Gly Asn Leu Gly Leu Leu Phe Met Leu Leu Phe Phe Ile Tyr Ala Ala
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  1970                  1975                  1980

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Thr Thr Ser Pro Arg Asn Trp Cys Ile Lys Met Val Cys Asn Pro Trp
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Phe Glu Cys Val Ser Met Leu Val Ile Leu Leu Asn Cys Val Thr Leu
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Gly Met Tyr Gln Pro Cys Asp Asp Met Asp Cys Leu Ser Asp Arg Cys
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Lys Ile Leu Gln Val Phe Asp Asp Phe Ile Phe Ile Phe Phe Ala Met
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Glu Met Val Leu Lys Met Val Ala Leu Gly Ile Phe Gly Lys Lys Cys
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Tyr Leu Gly Asp Thr Trp Asn Arg Leu Asp Phe Phe Ile Val Met Ala
145                 150                 155                 160
Gly Met Val Glu Tyr Ser Leu Asp Leu Gln Asn Ile Asn Leu Ser Ala
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Ile Arg Thr Val Arg Val Leu Arg Pro Leu Lys Ala Ile Asn Arg Val
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Pro Ser Met Arg Ile Leu Val Asn Leu Leu Leu Asp Thr Leu Pro Met
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Leu Gly Asn Val Leu Leu Leu Cys Phe Phe Val Phe Phe Ile Phe Gly
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225                 230                 235                 240
Leu Glu Glu Asn Phe Thr Ile Gln Gly Asp Val Ala Leu Pro Pro Tyr
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Tyr Gln Pro Glu Glu Asp Asp Glu Met Pro Phe Ile Cys Ser Leu Ser
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Gly Asp Asn Gly Ile Met Gly Cys His Glu Ile Pro Pro Leu Lys Glu
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Gln Gly Arg Glu Cys Cys Leu Ser Lys Asp Asp Val Tyr Asp Phe Gly
    290                 295                 300
Ala Gly Arg Gln Asp Leu Asn Ala Ser Gly Leu Cys Val Asn Trp Asn
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Arg Tyr Tyr Asn Val Cys Arg Thr Gly Ser Ala Asn Pro His Lys Gly
                325                 330                 335
Ala Ile Asn Phe Asp Asn Ile Gly Tyr Ala Trp Ile Val Ile Phe Gln
            340                 345                 350
Val Ile Thr Leu Glu Gly Trp Val Glu Ile Met Tyr Tyr Val Met Asp
        355                 360                 365
Ala His Ser Phe Tyr Asn Phe Ile Tyr Phe Ile Leu Leu Ile Ile Val
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Gly Ser Phe Phe Met Ile Asn Leu Cys Leu Val Val Ile Ala Thr Gln
385                 390                 395                 400
Phe Ser Glu Thr Lys Gln Arg Glu His Arg Leu Met Leu Glu Gln Arg
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Gln Arg Tyr Leu Ser Ser Ser Thr Val Ala Ser Tyr Ala Glu Pro Gly
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Gln Ala Leu Gly Pro Glu Ala Pro Ala Pro Ala Lys Pro Gly Pro His
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Ala Lys Glu Pro Arg His Tyr Gln Leu Cys Pro Gln His Ser Pro Leu
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Asp Ala Thr Pro His Thr Leu Val Gln Pro Ile Pro Ala Thr Leu Ala
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Ser Asp Pro Ala Ser Cys Pro Cys Cys Gln His Glu Asp Gly Arg Arg
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Pro Ser Gly Leu Gly Ser Thr Asp Ser Gly Gln Glu Gly Ser Gly Ser
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Gly Ser Ser Ala Gly Gly Glu Asp Glu Ala Asp Gly Asp Gly Ala Arg
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Ser Ser Glu Asp Gly Ala Ser Ser Glu Leu Gly Lys Glu Glu Glu Glu
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Glu Glu Gln Ala Asp Gly Ala Val Trp Leu Cys Gly Asp Val Trp Arg
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Glu Thr Arg Ala Lys Leu Arg Gly Ile Val Asp Ser Lys Tyr Phe Asn
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Arg Gly Ile Met Met Ala Ile Leu Val Asn Thr Val Ser Met Gly Ile
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Glu His His Glu Gln Pro Glu Glu Leu Thr Asn Ile Leu Glu Ile Cys
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Asn Val Val Phe Thr Ser Met Phe Ala Leu Glu Met Ile Leu Lys Leu
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Ala Ala Phe Gly Leu Phe Asp Tyr Leu Arg Asn Pro Tyr Asn Ile Phe
            660                       665                       670
Asp Ser Ile Ile Val Ile Ile Arg Pro Pro Thr Ala Ala Ser Tyr Leu
        675                       680                       685
Tyr Pro Gly Pro Ala Leu Arg Asp Arg Ser Ile Trp Glu Ile Val Gly
        690                       695                       700
Gln Ala Asp Gly Gly Leu Ser Val Leu Arg Thr Phe Arg Leu Leu Arg
705                       710                       715                       720
Val Leu Lys Leu Val Arg Phe Met Pro Ala Leu Arg Arg Gln Leu Val
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Val Leu Met Lys Thr Met Asp Asn Val Ala Thr Phe Cys Met Leu Leu
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Met Leu Phe Ile Phe Ile Phe Ser Ile Leu Gly Met His Ile Phe Gly
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Cys Lys Phe Ser Leu Arg Thr Asp Thr Gly Asp Thr Val Pro Asp Arg
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Lys Asn Phe Asp Ser Leu Leu Trp Ala Ile Val Thr Val Phe Gln Ile
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Leu Thr Gln Glu Asp Trp Asn Val Val Leu Tyr Asn Gly Met Ala Ser
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Thr Ser Pro Trp Ala Ser Leu Tyr Phe Val Ala Leu Met Thr Phe Gly
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Gln Ala Glu Gly Asp Ala Asn Arg Ser Tyr Ser Asp Glu Asp Gln Ser
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Ser Ser Asn Ile Glu Glu Phe Asp Lys Leu Gln Glu Gly Leu Asp Ser
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Leu Asp Pro Ser Leu Pro Leu Gly Gly His Leu Gly Pro Ala Gly Ala
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Ala Gly Pro Ala Pro Arg Leu Ser Leu Gln Pro Asp Pro Met Leu Val
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Ala Leu Gly Ser Arg Lys Ser Ser Val Met Ser Leu Gly Arg Met Ser
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Tyr Asp Gln Arg Ser Leu Ser Ser Ser Arg Ser Ser Tyr Tyr Gly Pro
945                 950                 955                 960
Trp Gly Arg Ser Ala Ala Trp Ala Ser Arg Arg Ser Ser Trp Asn Ser
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Leu Lys His Lys Pro Pro Ser Ala Glu His Glu Ser Leu Leu Ser Ala
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Glu Arg Gly Gly Gly Ala Arg Val Cys Glu Val Ala Ala Asp Glu Gly
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Pro Pro Arg Ala Ala Pro Leu His Thr Pro His Ala His His Val His
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His Gly Pro His Leu Ala His Arg His Arg His His Arg Arg Thr Leu
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Val Gly Ala His Pro Arg Ala Ala Trp Arg Ala Ala Gly Pro Ala Pro
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Phe Thr Lys Met Gly Asp Arg Gly Asp Arg Gly Glu Asp Glu Glu Glu
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Lys Leu Phe Asp Tyr Val Val Leu Ala Phe Ile Phe Leu Asn Cys Ile
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Thr Ile Ala Leu Glu Arg Pro Gln Ile Glu Ala Gly Ser Thr Glu Arg
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Ile Phe Leu Thr Val Ser Asn Tyr Ile Phe Thr Ala Ile Phe Val Gly
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Ala Tyr Leu Arg Ser Ser Trp Asn Val Leu Asp Gly Phe Leu Val Phe
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Val Ser Ile Ile Asp Ile Val Val Ser Leu Ala Ser Ala Gly Gly Ala
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Lys Ile Leu Gly Val Leu Arg Val Leu Arg Leu Leu Arg Thr Leu Arg
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Pro Leu Arg Val Ile Ser Arg Ala Pro Gly Leu Lys Leu Val Val Glu
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Thr Leu Ile Ser Ser Leu Lys Pro Ile Gly Asn Ile Val Leu Ile Cys
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Cys Ala Phe Phe Ile Ile Phe Gly Ile Leu Gly Val Gln Leu Phe Lys
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Gly Lys Phe Tyr His Cys Leu Gly Val Asp Thr Arg Asn Ile Thr Asn
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Arg Ser Asp Cys Met Ala Ala Asn Tyr Arg Trp Val His His Lys Tyr
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Tyr Phe Ile Ser Phe Leu Leu Ile Val Ser Phe Phe Val Leu Asn Met
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Pro Arg Leu Pro Thr Gly Ser Pro Gly Ala Pro Gly Arg Gly Pro Gly
1745                1750                1755                1760
Gly Ala Gly Gly Gly Gly Asp Thr Glu Gly Gly Leu Cys Arg Arg Cys
                1765                1770                1775
Tyr Ser Pro Ala Gln Glu Asn Leu Trp Leu Asp Ser Val Ser Leu Ile
                1780                1785                1790
```

```
Ile Lys Asp Ser Leu Glu Gly Glu Leu Thr Ile Ile Asp Asn Leu Ser
    1795                    1800                1805
Gly Ser Ile Phe His His Tyr Ser Ser Pro Ala Gly Cys Lys Lys Cys
    1810                    1815                1820
His His Asp Lys Gln Glu Val Gln Leu Ala Glu Thr Glu Ala Phe Ser
1825                    1830                1835                1840
Leu Asn Ser Asp Arg Ser Ser Ser Ile Leu Leu Gly Asp Asp Leu Ser
                    1845                    1850                1855
Leu Glu Asp Pro Thr Ala Cys Pro Pro Gly Arg Lys Asp Ser Lys Gly
                1860                    1865                1870
Glu Leu Asp Pro Pro Glu Pro Met Arg Val Gly Asp Leu Gly Glu Cys
                1875                    1880                1885
Phe Phe Pro Leu Ser Ser Thr Ala Val Ser Pro Asp Pro Glu Asn Phe
            1890                    1895                1900
Leu Cys Glu Met Glu Glu Ile Pro Phe Asn Pro Val Arg Ser Trp Leu
1905                    1910                1915                1920
Lys His Asp Ser Ser Gln Ala Pro Pro Ser Pro Phe Ser Pro Asp Ala
                    1925                    1930                1935
Ser Ser Pro Leu Leu Pro Met Pro Ala Glu Phe Phe His Pro Ala Val
                1940                    1945                1950
Ser Ala Ser Gln Lys Gly Pro Glu Lys Gly Thr Gly Thr Gly Thr Leu
            1955                    1960                1965
Pro Lys Ile Ala Leu Gln Gly Ser Trp Ala Ser Leu Arg Ser Pro Arg
    1970                    1975                1980
Val Asn Cys Thr Leu Leu Arg Gln Val Pro Thr Pro Pro Arg Pro
1985                    1990                1995
```